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TITLE: Information technology -- International Standardized Profile -- Common Upper Layer Requirements -- Part 4: Connectionless Minimal OSI upper layer facilities

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Editor: Henry A. Lowe

Open Software Foundation

11 Cambridge Center, Cambridge, MA 02142, USA

+1-617-621-8783 fax: +1-617-621-0584

lowe@osf.org

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This document is a draft for the profile of the minimal OSI facilities necessary to support basic connectionless communication applications. These facilities are comprised of a subset of the facilities defined in the connectionless ACSE, Presentation and Session service definitions.

The schedule for the progression of all parts of the Common Upper Layer Requirements to become ISP's is TBD.

International Standardized Profileæ
Common upper layer requirementsæPart 4:
Connectionless Minimal OSI upper layers facilities

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental or non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC1. In addition to developing International Standards, ISO/IEC JTC1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

An International Standardized Profile is an internationally agreed, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions.

Draft International Standardized Profiles are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75% of the national bodies casting a vote.

This part of ISO/ISP 11188 was prepared with the collaboration of

-- Asia-Oceania Workshop (AOW);

-- European Workshop for Open Systems (EWOS);

-- OSE Implementors Workshop (OIW).

%% Annexes A , B, C , D, E and F form an integral part of this part of ISO/IEC ISP 11188. Annexes G and H are informative.

Introduction

This part of ISO/IEC ISP 11188 is defined within the context of Functional Standardization, in accordance with the principles specified by ISO/IEC TR 10000, "Framework and Taxonomy of International Standardized Profiles". The context of Functional Standardization is one part of the overall field of Information Technology (IT) standardization activities, covering base standards, profiles, and registration mechanisms. A profile defines a combination of base standards that collectively perform a specific, well-defined IT function. Profiles standardize the use of options and other variations in the base standards, and provide a basis for the development of uniform, internationally recognized system tests.

ISO/IEC ISP 11188 specifies a common set of OSI upper layer facilities which are supported by OSI protocols for use in A-profiles. These are identified as "Common Upper Layer Requirements".

The parts of this multi-part ISP do not contain the definition of any complete profiles, but can be referenced normatively by other ISPs which do define A-profiles. In addition, a referencing ISP may specify further requirements on the protocols, provided it does not contradict this ISP.

The purpose of this multi-part ISP is to provide common text for ISPs or other referencing specifications which specify A-profiles. In addition to simplifying their drafting, it also facilitates the common implementation of the protocols for use in different A-profile contexts.

This part of ISO/IEC 11188 specifies a profile of the minimal OSI facilities supporting basic connectionless communications applications. These facilities are comprised of a subset of the facilities defined by the connectionless ACSE, presentation, and session service definitions.

Information technologyæInternational Standardized Profileæ Common upper layer requirementsæPart 4: Connectionless Minimal OSI upper layers facilities

1 Scope

This part of ISO/IEC ISP 11188[1] introduces the concept of the minimal set of OSI upper layer facilities[2] for basic communications applications. A **basic communications application** simply requires the ability to send or receive messages with a peer. It is expected that a large portion of potential OSI applications will be basic communications applications.

1.1 General

This Profile specifies the minimal set of upper layer facilities required for the support of connectionless basic communications applications. The minimal OSI facilities are referred to as **mOSI**. mOSI facilities are specified for options%% and roles of basic communications applications as identified in 2.3.

This Profile defines the mOSI facilities in terms of identified features of the connectionless upper layer PICS proformas – the ACSE (ISO/IEC 10035-2), the Presentation Layer (ISO 9576-2), and the Session Layer (ISO 9548-2). The identified features of these PICS proformas are specified in annexes A, B, and C, respectively.

This Profile conforms to the requirements stated in ISO/IEC ISP 11188-1, Basic Connection-oriented Requirements.

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1 In the remainder of this document, the term "Profile" is used to denote this "part of ISO/IEC ISP 11188."

2 The upper layer facilities considered in this Profile are connectionless ACSE, Presentation, and Session.

Ed. Note: Will there be a CLS version for CURL-1??

This Profile may be referenced by two classes of entities: upper layer *users* and upper layer *providers*.

- æ mOSI *users* represent basic communications applications. mOSI users may be profiles (such as A-profiles defined in ISO/IEC TR 10000-2 or specifications of basic communications applications that are not represented by a formal profile. An API is a special case of the latter.

- æ mosi *providers* represent implementations of the upper layer facilities that provide (at a minimum) the facilities defined in this Profile.

A profile or the specification of a basic communications application (a mOSI user) may claim compliance[1] to this Profile. It may do so if the OSI upper layer facilities that it requires may be defined in terms of the facilities of this Profile. Subclause 2.1 summarizes the requirements for making such a statement. Annex D provides the proforma for the requirements compliance statement.

An implementation of the OSI upper layers (a mOSI provider) may claim *conformance*[2] to this Profile. It may do so if the OSI upper layer facilties that it provides include those facilities defined in this Profile. That is, an implementation may contain more upper layer facilties than those required to be conformant to this Profile. However, they must contain at least those of this Profile. Subclause 2.2 summarizes the requirements for making a conformance statement. Annex E provides the proforma for the profile implementation statement.

Annex F assigns object identifier values for specific generic definitions of application context, abstract syntax, and transfer syntax.

1.2 Position within the taxonomy

This Profile does not specify a full A-profile, and therefore is not included in the taxonomy of ISO/IEC TR 10000-2.

2 Compliance and conformance

2.1 Profile or specification of a basic communications application

A profile (e.g. an ISO/IEC ISP) or the specification of a basic communications application may reference this Profile to identify its upper layer requirements. It may do this by claiming that its upper layer requirements comply to this Profile. Such a claim indicates that its upper layer requirements are satisfied by features specified in this Profile.

A profile or specification may claim that its requirements comply to this Profile if it:

a) replicates the Profile's mandatory features for the roles identified;
b) replicates the Profile's "out of scope" (i) and "excluded" (x) features; and
c) completes tables D.1 and D.2 in annex D to identify the options and roles which define it.

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1 **Compliance** deals with one *specification* referencing another specification; **conformance** deals with a *physical implementation* that references another specification.

2 Ibid.

There are two ways in which an application profile or specification may be compliant with this Profile:

a) the application profile or specification may repeat all of the specifications contained in this Profile. To claim compliance to this Profile, such a profile or specification shall assure that its specification of the ACSE, presentation, and session features does not violate the provisions in this Profile.

b) the profile or specification may claim upper layer compliance to this Profile by reference instead of repeating the provisions of this Profile

An API is a special type of an application that utilizes the services of the upper layers. The specification of an API may claim compliance with this Profile. Such a claim indicates that the API (or API subset) supports features specified in this Profile.

An API specification[1] may claim compliance to this Profile if the API specification:

a) supports all Profile mandatory features defined in annexes A, B, and C for the roles identified;

b) can be restricted to not use of the Profile's "out of scope" (i) features and "excluded" (x) features when operating in the "mOSI mode;" and

c) completes tables D.1 and D.2 in annex D to identify the options, and roles that it supports.

2.2 OSI upper layer stack implementation

The implementation of an OSI upper layer stack may reference this Profile to claim that it supports some or all of the features specified in this Profile. The implementation may in fact support additional upper layer facilitiesæwithout violating any of the facilities of this Profile.

An implementation may claim conformance to this Profile if it

a) supports all Profile mandatory features defined in annexes A, B, and C for the roles identified;

b) can be restricted in the support of the Profile's "excluded" (x) features are not involved;

c) completes tables E.1 and E.2 in annex E to identify the options, and roles supported; and

d) if it uses an API it can insure that it does not use any "out of scope" or "excluded" features through the use of the API.

2.3 Roles

This Profile defines **mOSI compliance** in terms for three optional roles:

a) sender of Unit Data exclusively; or

b) receiver of Unit Data exclusively; or

c) both sender and receiver of Unit Data.

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1 The "API specification" claiming compliance may represent the entirety of the API functionality or it may be an identified subset of an API specification. XTI/mOSI is an example of an "entire" API that may claim compliance. A subset of XAP could be an example of a subset of an API that could claim compliance.

For the purposes of this Profile, this set of roles is expressed by the variable *Role*. The variable may assume one of the following values: "sender", or "receiver", or "both." This variable is used in annexes A, B, and C to define conditionally the requirements of ACSE, presentation, and session.

2.4 Relationship to base standards

2.4.1 Connectionless ACSE

This Profile allows all three roles identified in ISO 10035.

For ACSE, identified parameters optionally may not be supported for sending. However, support for the receiving of all parameters is required.

Specifically, support for the receiving of both forms of the AE title datatypes (Directory Name and Object Identifier) is required.

The required facilities of ACSE are specified in annex A. A default value for application context name is defined in annex F.

2.4.2 Connectionless Presentation Layer

This Profile specifies all three roles identified in ISO 9576.

The required facilities of presentation are specified in annex B. Default values for user abstract syntax name and user transfer syntax name are defined in annex F.

2.4.3 Connectionless Session Layer

This Profile specifies all three roles identified in ISO 9548.

The required facilities of session are specified in annex C. The requirements expressed in ISO/IEC ISP 11188-1 shall also apply to the Session Layer aspects of this Profile.

2.5 Transport-provider

As mentioned in clause 5 (Model), this Profile does not address the lower four OSI layers (Transport, Network, Link, and Physical Layers). They are considered outside of the scope of this specification.

A transport-provider is needed to transport the connectionless ACSE, Presentation, and Session PDUs of an mOSI implementation. As such the transport-provider shall supply services equivalent to those defined in the OSI Transport Layer service definition (ITU-T Rec. X.%% | ISO %%).

3 Normative references [Ed. Note: Not yet updated.]

The following ITU-T Recommendations | International Standards contain provisions which, through reference in this text, constitute provisions of this ITU-T Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendation and Standards are subject to revision, and parties to agreements based on this ITU-T Recommendation | International

Standard are encouraged to investigate the possibility of applying the most recent editions of the ITU-T Recommendations | International Standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards. The ITU-T Secretariat maintains a list of the currently valid ITU-T Recommendations.

3.1 Identical Recommendations | International Standards

- æ ITU-T Recommendation X.227 (1994) | ISO 8650: 1994, *Information processing systemsæOpen Systems InterconnectionæProtocol specification for the Association Control Service Element.*
- æ ITU-T Recommendation X.200 (1994) | ISO 7498: 1994, *Information processing systemsæOpen Systems InterconnectionæBasic Reference Model.*
- æ ITU-T Recommendation X.225 (1994) | ISO 8327:1994, *Information processing systemsæOpen Systems InterconnectionæConnection oriented session protocol specification.*
- æ ITU-T Recommendation X.226 (1994) | ISO 8822:1994, *Information processing systemsæOpen Systems InterconnectionæConnection oriented presentation protocol specification.*

3.2 Paired Recommendations | International Standards equivalent in technical content

- æ CCITT Recommendation X.210 (1988), *OSI Layer Service Definition Conventions for CCITT applications.*
  ISO/TR 8509:1986, OSI Layer Service Definition Conventions.
- æ CCITT Recommendation X.214 (1988), *Transport service definition for Open Systems Interconnection for CCITT applications.*
  ISO 8072:1986, Information processing systemsæOpen Systems InterconnectionæTransport service definition.

3.3 Additional references

- æ ISO 7498-3:1988, *Information processing systemsæOpen Systems InterconnectionæBasic Reference ModelæPart 3: Naming and Addressing.*
- æ ISO 8327-2:1992, *Information processing systemsæOpen Systems InterconnectionæConnection oriented session protocol specificationæPart 2: Protocol Implementation Conformance Statement (PICS) Proforma.*
- æ ISO 8650-2: 1992, *Information processing systemsæOpen Systems InterconnectionæProtocol specification for the Association Control Service ElementæPart 2: Protocol Implementation Conformance Statement (PICS) Proforma .*
- æ ISO 8823:1992, *Information processing systemsæOpen Systems InterconnectionæConnection-oriented Presentation Protocol SpecificationæPart 2: Protocol Implementation Conformance Statement (PICS) Proforma.*
- æ ISO/IEC 9545:1993, *Information technologyæOpen Systems InterconnectionæApplication Layer Structure*
- æ ISO/IEC TR 10000-1:1992, *Information technologyæFramework of taxonomy of International Standardized ProfilesæPart 1: Framework.* .
- æ ISO/IEC TR 10000-2:1992, *Information technologyæFramework of taxonomy of International Standardized ProfilesæPart 2: Taxonomy of Profiles.*

æ *ISO/IEC ISP 11188-1:1994*[1], Information technologyæInternational Standardized ProfileæCommon upper layer requirementsæPart 1: Basic connection-oriented requirements.

1Currently at level of draft international standardized profile

4 Definitions [Ed. Note: Not yet updated.]

This Profile makes use of the following definitions.

4.1 Reference model definitions

4.1.1 Basic Reference Model definitions

This Profile is based on the concepts developed in ITU-T Rec. X.200 | ISO 7498-1 and ISO 7498-1/AD1. It makes use of the following terms defined in them:

a) application-entity;
b) application-function;
c) Application Layer;
d) application-process;
e) application-protocol-control-information;
f) application-protocol-data-unit;
g) application-service-element;
h) connectionless-mode presentation-service;
i) (N)-connectionless-mode transmission;
j) (N)-function;
k) presentation-connection;
l) Presentation Layer;
m) presentation-service;
n) session-connection;
o) Session Layer;
p) session-protocol;
q) session-service;
r) Transport Layer

4.1.3 Naming and addressing definitions

This Profile makes use of the following terms defined in ISO 7498-3:

a) application-process title;
b) application-entity qualifier;
c) application-entity title;
d) application-process invocation-identifier;
e) application-entity invocation-identifier; and
f) presentation address.

4.2 Service conventions definitions

This Profile makes use of the following terms defined in CCITT Rec. X.210 | ISO/TR 8509:

a) service-provider;
b) service-user;
c) confirmed service;

d) non-confirmed service;
e) provider-initiated service;
f) primitive;
g) request (primitive);
h) indication (primitive);
i) response (primitive); and
j) confirm (primitive).

4.3 Presentation definitions

This Profile makes use of the following terms defined in ITU-T Rec. X.216 | ISO 8822 and ISO 8822/AD1 and ITU-T Rec. X.226 | ISO 8823 and ISO 8823/AD2:

a) abstract syntax;
b) abstract syntax name;
c) connectionless-mode [presentation];
d) default context;
e) defined context set;
f) functional unit [presentation];
g) normal mode [presentation];
h) presentation context;
i) presentation data value; and
j) presentation selector

4.4 Session definitions

This Profile makes use of the following terms defined in ITU-T Rec. X.215 | ISO 8326 and ITU-T Rec. X.225 | ISO 8327:

a) session selector

4.5 Application Layer Structure definitions

This Profile makes use of the following terms defined in ISO/IEC 9545:

a) application-context;
b) application-entity invocation;
c) control function; and
d) application-service object.

4.6 ACSE service definitions

This Profile makes use of the following terms defined in ISO/IEC 8649:

a) application-association; association
b) Association Control Service Element
c) ACSE service-user
d) ACSE service-provider
e) requestor
f) acceptor

g) association-initiator
h) association-responder

4.7 Definitions of this Profile

For the purpose of this Profile, the following definitions apply.

API specification; application programmatic interface specification: The functional specification of the local manifestation of the facilities of an identified stack specification. An API is normally defined as a set of procedure calls in a particular programming language.

API; application programmatic interface: An implementation of an identified API specification.

basic communications application: An application program that simply requires the ability to open and close communications with a peer and to send and receive messages with that peer.

compliance: The referencing specification requires all mandatory features listed in the sending columns of the tables in annexes A, B and C.

conformance: The referencing implementation supports all mandatory features listed in the sending columns of the tables in annexes A, B, and C.

mOSI API specification: A functional specification of the local manifestation of the facilities of the mOSI stack specification (CULR-3).

mOSI specification; mOSI stack specification: This specification that defines the minimal facilities of the Session Layer, Presentation Layer, and ACSE (CULR-3).

mOSI stack; mOSI stack implementation: An implementation that supports, at a minimum, the facilities defined in the mOSI stack specification (CULR-3).

mOSI platform specification: The functional specification of a formal programmatic interface and a set of supporting local services for the mOSI stack specification (CULR-3).

mOSI platform: An implementation of the mOSI platform specification.

non-basic communications application: An application program that requires the ability to support functions other than those specified in the definition a basic communications application.

platform: An implementation of an identified platform specification.

platform-based application: An application program that conforms to a platform specification.

pdv-processor: part of an implementation which wraps and unwraps the "pdv envelope" around the syntax sent and received in the identified presentation context.

platform specification: The functional specification of a formal programmatic interface and a set of supporting local services for an identified stack specification.

specific basic communications application: an application that is not referenced by any ISP.

stack; stack implementation: An implementation of an identified stack specification

stack specification: The functional specification of a set of interrelated standards for the purpose of providing a common service (set of facilities).

standalone application: Any application program which is not a platform-based application.

supported as receiver: The specified feature shall be acceptable to any receiving mOSI compliant implementation.

supported as sender: The specified feature shall be implemented by any sending mOSI compliant implementation.

transport-provider: A provider of those transport services which are defined in ISO 8072.

5 Abbreviations [Ed. Note: Not yet updated.]

The following abbreviations are used in this Profile.

ACSE	Association Control Service Element
APDU	application-protocol-data-unit
API	application programmatic interface
ASN.1	Abstract Syntax Notation One
BCA	basic communications application
CCITT	International Telegraph and Telephone Consultative Committee
CULR	Common Upper Layers Requirements
ICS	implementation conformance statement
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
ISP	International Standardized Profile
ITU-T	International Telegraph and Telephone - Telecommunication Systems and Services
mOSI	minimal OSI upper layer facilities
OSI	Open Systems Interconnection
PDU	protocol-data-unit
PDV	protocol data value
PICS	protocol implementation conformance statement
PPDU	presentation-protocol-data-unit
SPDU	session-protocol-data-unit
TSDU	transport-service-data-unit

6 Conventions

This Profile defines a minimal set of facilities for connectionless basic communications applications. The facilities specified are a subset of those contained in the ACSE, the Presentation Layer, and the Session Layer. This Profile states the required minimal functionality by stating requirements for completing the PICS Proforma of these three upper layer specifications.

The requirements for filling out the PICS Proformas are contained in annexes A, B, and C. The requirements are specified by means of a series of tables in these annexes. Each table in an annex refers to one identified table in the respective PICS Proforma. Each row in an annex table refers to a corresponding row in the corresponding PICS table. Each row specifies how a particular feature is supported.

In each table, the "Profile" column(s) indicates the requirements of this Profile for the support of a given feature. For each feature, the "Profile" column(s) define the support required by one of the identifiers ("Id") in table 1.

Table 1 – Profile column identifiers

	Id (CULR-3)	Referencing Spec	Referencing Implementation
1	m	mandatory æ The feature must be supported.	mandatory æ The implementation shall support the feature. When completing the associated PICS Proforma table, the answer for the "Support" column shall be 'Y' – yes, the feature has been implemented.
2	o	optional æ If the feature is supported, it will be used.	optional æ The implementation may or may not send the feature. When completing the associated PICS Proforma table, the answer for the "Support" column shall either be: 'Y' – yes, the feature has been implemented; or 'N' – no, the feature has not been implemented. The implementation shall not abort if the feature is received.
3	c [n]	conditionally supported æ Support for the feature is further defined by a condition ("n") which is annexed to the table.	conditionally supported æ Support for the feature is further defined by a condition ("n") which is annexed to the table. Depending on the condition, when completing the associated PICS Proforma table, the answer for the "Support" column shall either be: 'Y' – yes, the feature has been implemented; or 'N' – no, the feature has not been implemented; or '-' – not applicable.
4	x	excluded æ The feature shall never be used.	excluded æ The implementation shall not send the feature. When completing the associated PICS Proforma table, the answer for the "Support" column shall be 'N' – no, the feature has not been implemented. The implementation shall abort if the feature is received.
5	i	out of scope æ The requirement for the support of this feature is not covered by this Profile.	out of scope æ The requirement for the support of this feature is not covered by this Profile. When completing the associated PICS Proforma table, the answer for the "Support" column shall either be: 'Y' – yes, the feature has been implemented; or 'N' – no, the feature has not been implemented. "out of scope" differs from "conditionally supported." The receipt of a semantic of the "out of scope" feature

			may be treated as a protocol error, i.e. the implementation may or may not abort if the feature is received. It is assumed that no conformance testing will be applied for this feature.
6	**n/a**	**not applicable æ** **The feature is not defined by the base standard in the context where it is mentioned in a table.**	**not applicable æ The feature is not defined by the base standard in the context where it is mentioned in a table.**

NOTE -- Mandatory support in a receiving column implies that the appropriate action is taken when a value for that feature is received. An appropriate action may be defined by a referencing specification. A default action is defined by the successful completion of the processing of the value by the protocol machine.

µ §

7 Model

This clause presents the mOSI model and defines many of the terms used in this Profile. The mOSI model, as shown in figure 1, illustrates the mOSI stack in three different environments which are detailed in 7.2 and 7.3. It can be viewed in two contexts: it can be viewed abstractly – where the various elements represent abstract "specifications;" or it can be viewed concretely – where the elements represent those of an implementation.

7.1 Common elements

There are common elements in all three environments shown in figure 1. They are:

- ó *basic communications application*
- ó *pdv-processor*
- ó *mOSI stack;*
- ó *transport services and*
- ó *transport provider*

A connectionless **basic communications application (BCA)** simply requires the ability to exchange datagrams with a peer. This Profile addresses the requirements of connectionless basic communications applications.

A stack represents a set of layered, interdependent communication standards (in the abstract sense) and their implementation (in the concrete sense). The **mOSI stack** represents the connectionless ACSE, presentation, and session standards (protocol specifications) or their implementation with the features specified in this Profile.

NOTE – A stack does not necessarily represent a layered implementation of the layered standards. On the contrary, it is

recommended in annex H that the implementation of a mOSI stack is one protocol engine, not three.

From the perspective of the presentation protocol (ISO 9576), the syntax (encoded data) sent from one application to its peer is a series of one or more presentation-data-values (pdv's). The ISO presentation protocol defines the encoding of the outer envelope of a pdv and the encoding for groups of pdv's (if any). The actual contents of a pdv is a function of the abstract and transfer syntax of the pdv – its presentation context. While ASN.1 basic encoding rules can be used for encoding abstract and transfer syntax, it is not the only choice.

The selection, definition and encoding of syntax sent between connected applications is outside of the scope of the mOSI stack.[1] The **pdv-processor** represents the wrapping and unwrapping of the "pdv envelope" around the syntax sent or received in the identified presentation context. As shown in figure 1, the pdv-processor can be located at a number of different places within the model. The mOSI model assumes that pdv encoding and decoding is done outside of the mOSI stack.

This Profile does not address the four lower OSI layers (Transport, Network, Link, and Physical Layers). They are considered outside of the scope of this Profile. However, a **transport-provider** is needed to transport the ACSE, presentation, and session PDUs of a mOSI implementation. As such, the transport-provider supplies **transport services** equivalent to those defined in the OSI Transport Layer service definition (ISO 8072%% connectionless Transport doc number).

This specification does not place any requirements on the actual transport provider (layer 4 and below) used as long as services equivalent to the OSI transport services are provided.

7.2 Standalone applications

For the purposes of this Profile, a **standalone application** is one that includes the application pdv-processor and the mOSI stack as a single unit application.[2] For an implementation, the mOSI stack may be a series of separate modules with its own internal programmatic interface or as a single state machine.

7.3 Platform-based applications

A communications platform allows a division between an application program and its communications provider. A **platform** comprises the communication facilities in one system necessary to support a distributed application. A **platform-based application** represents the non-communication aspects of a distributed application in one system. An **application programmatic interface (API)** is the formal interface between a communication platform and its user [platform-based] applications. It is formal in the sense that the API is specified so as to allow the use of the platform by different types of applications – most often, in parallel. The **programmatic interface** represents the mapping of the API to the internals of the supporting system.

A **mOSI platform** consists of a mOSI API, a mOSI stack in conjunction with the normal facilities provided by a platform (e.g. POSIX services in the case of a UNIX based platform).

A **mOSI API** represents the interface to the mOSI stack. It provides the minimal features of the OSI

1 It is also out of the scope of the presentation protocol (ISO 8823).

2 Many ISP are written from the point of view of standalone applications. However, the actual implementation of the ISP could result in a platform-based application.

upper layers as defined in this Profile.

As discussed in annex G, mOSI identifies two types of basic communications applications: migrant applications and kernel applications. Depending on the type of application, the pdv-processor could either be a part of the platform or a part of each platform-based application.

7.3.1 Migrant applications

OSI (and mOSI) has two required features that are not part of other transport providers:

a) application context[1]; and
b) presentation context[2] – abstract syntax name and transfer syntax name pair.

An OSI upper layer stack requires that names be provided for application context, abstract syntax, and transfer syntax. These names may be hidden from the API user by having the programmatic interface provide default values (see annex F).

A basic communications application running over a stack (see G.2.3.2) is unaware (or at least, not concerned) with formally identifying application context and the presentation context of the data sent and received. Instead, it allows the programmatic interface to provide default values (see annex F). The encoding and decoding of the pdv's are hidden by placing the pdv-processor within the platform.

7.3.2 Kernel application

A kernel application (see G.2.3.1) is an OSI-based application. It is aware of the mandated application context names and presentation context.

Most likely, (but, not necessarily) the application's own protocol will be specified and encoded using ASN.1. For this reason the pdv-processor is shown in Figure 1 within the application itself – rather than as part of the platform. It is not expected that a kernel application will use the default values for abstract syntax and transfer syntax defined in annex F.

1 see ISO/IEC 9545 for details

2 see ISO/IEC 8823 for details

Annex A

(Normative)

Requirements for Connectionless ACSE facilities

This annex specifies the Connectionless ACSE requirements for completing the PICS (ISO/IEC DIS 10035-2) for the roles and options selected (see 2.2).

The specifications in this annex are based on the Proforma tables of the ACSE PICS Proforma. The clause numbers and tables referenced in this annex are those of the ISO/IEC DIS 10035-2. If a clause number of ISO/IEC DIS 10035-2 is not mentioned, it is out of the scope of this Profile. It may be ignored and will, therefore, not be subject to the compliance statement of this Profile.

The specifications references the following variable: *Role.* This is discussed in 2.3.

NOTEæPICS clauses A.1-A.4 are outside of the scope of this Profile.

A.1 Supported APDUs – [PICS clause A.5]

	APDU	Profile: Sender	Profile: Receiver	PICS reference	Comment
1	**AUDT**	**c[1]**	**c[2]**	**A.5**	

[1] "m" if "isender" or "both"; otherwise "i"

[2] "m" if "receiver" or "both"; otherwise "i"

A.2 Supporting APDU parameters – [PICS clause A.6]

	Parameter	Profile: Sender [a]	Profile: Receiver [b]	PICS reference	Comment
1	**Protocol Version**	**m[3]**	**m[4]**	**A.6.1/1**	**= version 1**
2	**Application Context Name**	**m**	**m**	**A.6.1/2**	
3	**Calling AP Title**	**o[1]**	**m**	**A.6.1/3**	
4	**Calling AE Qualifier**	**o[1]**	**m**	**A.6.1/4**	
5	**Calling AP Invocation-identifier**	**o[2]**	**m**	**A.6.1/5**	
6	**Calling AE Invocation-identifier**	**o[2]**	**m**	**A.6.1/6**	
7	**Called AP Title**	**o[1]**	**m**	**A.6.1/7**	
8	**Called AE Qualifier**	**o[1]**	**m**	**A.6.1/8**	
9	**Called AP Invocation-identifier**	**o[2]**	**m**	**A.6.1/9**	
10	**Called AE Invocation-identifier**	**o[2]**	**m**	**A.6.1/10**	

11	**Implementation Information**	**o**	**m**	**A.6.1/11**
12	**User Information**	**m**	**m**	**A.6.1/12**

[a] This entire column has the value of "i" if Role is "recewiver"; otherwise the value is as marked.

[b] This entire column has the value of "i" if Role is "sender"; otherwise the value is as marked.

[1] If either the AP title or AE qualifier is supported for sending, the other must also be selected.

[2] This value may be supported for sending only if the associated AP title and AE qualifier are supported for sending. If supported, both the AP invocation identifier and the AE invocation identifier shall be supported for sending.

[3] May be omitted if the default value specified in ASN.1 is intended.

[4] If absent, a receiver shall interpret the omission of an explicit value for this parameter as implying this default value.

A.6 Supported parameter forms – [PICS clause A.??]

Editor's Note: %% Shouldn't there be a corresponding table in the 10035 PICS???

A.6.1 AE Title name form – [PICS A.??]

	Syntax form	Profile: Sender	Profile: Receiver	PICS reference	Comment
1	**Form 1 (Directory name)**	**o**	**m**	**A.10.1/1**	
2	**Form 2 (Object identifier and integer)**	**o**	**m**	**A.10.1/2**	

NOTE –

Annex B

(Normative)

Requirements for Presentation Layer facilities

This annex specifies the presentation requirements for completing the Presentation PICS (ISO 9576-2) for the role selected (see 2.3).

The specifications in this annex are based on the Proforma tables of the Presentation Layer PICS Proforma. The clause numbers and tables referenced in this annex are those of ISO 8823-2. If a clause number of ISO 8823-2 is not mentioned it is out of the scope of this Profile. It may be ignored and will, therefore, not be subject to the compliance statement of this Profile.

The specifications references the following variable: *Role.* These are discussed in 2.3.

NOTEæPICS clauses A.1-A.4 are outside of the scope of this Profile.

B.1 Elements of procedure related to the PICS – [PICS clause A.6]

B.2.1 Kernel functional unit – [PICS A.6.1]

B.2.1.1 Supported roles – [PICS A.6.1.1]

B.2.1.1.1 Presentation-connection – [PICS A.6.1.1.1]

	Role	Profile	PICS reference	Comment
1	**Initiator**	**c[1]**	**A.6.1.1.1/1**	
2	**Responder**	**c[2]**	**A.6.1.1.1/2**	

[1] "m" if Establishment-role is "initiator" or "both"; otherwise "i"

[2] "m" if Establishment-role is "responder" or "both"; otherwise "i"

B.3 Supported PPDU parameters – [PICS clause A.7]

B.3.1 Connect presentation (CP) parameters – [PICS A.7.1]

	Parameter	Profile: Sender [a]	Profile: Receiver[b]	PICS reference	Comment
1	**Protocol version**	**o**	**m**	**A.7.1/5**	**= version 1**
2	**Calling presentation selector**	**o**	**m**	**A.7.1/1**	

3	**Called presentation selector**	**m**	**m**	**A.7.1/2**
4	**Presentation context definition list**	**m**	**m**	**A.7.1/4**
5	**User data**	**m**	**m**	**A.7.1/9**

[a] This entire column has the value of "i" if Establishment-role is "responder"; otherwise the value is as marked.

[b] This entire column has the value of "i" if Establishment-role is "initiator"; otherwise the value is as marked.

B.4 Support of syntax's – [PICS clause A.8]

B.4.1 Transfer syntax's supported – [PICS A.8.1]

	Type	Detail	Profile	Reference to definition	Reference to restriction
1	**Object identifier**	**= {joint-iso-ccitt asn1(1) basic-encoding(1)}**	**m**	**ISO/IEC IS 8825**	**ISO/IEC ISP 11188-1**
2	**Object identifier**	**(see annex E)**	**o**	**ISO/IEC ISP 11188-3**	**none**

NOTEæOther transfer syntax's may be added to the above table based on the application(s) supported.

B.4.2 Abstract syntax's supported – [PICS A.8.2]

	Type	Detail	Profile
1	**Object identifier**	**{joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(0) version1(1)**	**m**
2	**Object identifier**	**(see annex E)**	**o**

NOTEæOther abstract syntax's may be added to the above table based on the application(s) supported.

B.4.3 Use of ASN.1 encoding – [PICS A.8.3]

The following table is used to indicate any coding restrictions for sending **all** ACSE's APDUs, PPDUs and User Information on ACSE APDU's (see PICS A.8.3).

	Restriction	Profile	Comment
1	**Only definite form of length encoding used**	**o**	
2	**Indefinite form of length encoding used for all constructed types**	**o**	
3	**Only minimal number of octets used for definite form of length encoding**	**o**	
4	**Only primitive encoding used for OCTET STRING**	**o**	
5	**Only primitive encoding used for BITSTRING**	**o**	

NOTEæ PICS subclause A.8.4 is out of the scope (i) of this Profile.

Annex C

(Normative)

Requirements for Connectionless Session Layer facilities

This annex specifies the connectionless session requirements for completing the Session PICS (ISO 9548-2) for the roles, and options selected (see 2.2).

The specifications in this annex are based on the Proforma tables of the Connectionless Session Layer PICS Proforma. The clause numbers and tables referenced in this annex are those of ISO 9548-2. If a clause number of ISO 9548-2 is not mentioned it is out of the scope of this Profile. It may be ignored and will, therefore, not be subject to the compliance statement of this Profile.

The specifications references the following variables: *Establishment-role*, *Normal-data-role*, and *Release-role*. These are discussed in 2.2.

NOTEæPICS clauses A.1-A.3 are outside of the scope of this Profile.

C.1 Global statement of conformance – [PICS A.4]

	Question	Answer	PICS reference
1	**Are all mandatory features implemented?**	**yes**	**A.4/1**

C.2 Supported SPDUs – [PICS A.5]

	SPDU	Profile: Sender [a]	Profile: Receiver [b]	PICS reference	Comment
1	**UNIT DATA (UD)**	**C[1]**	**C[2]**	**A.5/1**	

[1] "m" if role is "requestor" or "both"; otherwise "i"

[2] "m" if role is "acceptor" or "both"; otherwise "i"

C.2.1 Roles – [PICS A.5]

	Role	Profile	PICS reference	Comment
1	**Sender**	**c[1]**	**A.5/1**	**An implementation shall support one of these roles**
2	**Receiver**	**c[2]**	**A.5/1**	**An implementation shall support one**

of these roles

[1] "m" if role is "sender" or "both"; otherwise "i"

[2] "m" if role is "receiver" or "both"; otherwise "i"

C.3 Supported SPDU parameters – [PICS A.6]

C.3.1 Role – [PICS A.6]

		Profile: Sender [a]	Profile: Receiver [b]	PICS reference	Comment
1	**Sending**	**m**	**i**	**A.6.1/1**	
2	**Receiving**	**i**	**m**	**A.6.2/1**	

[a] This entire column has the value of "i" if Establishment-role is "responder"; otherwise the value is as marked.

[b] This entire column has the value of "i" if Establishment-role is "initiator"; otherwise the value is as marked.

C.3.2 Parameters – [PICS A.6.1 and A.6.2]

	Single Items	Profile: Sender [a]	Profile: Receiver [b]	PICS reference	Comment
1	**Version number**	**o**	**m**	**A.6.x/1**	
2	**Calling Session Selector**	**o**	**m**	**A.6.x/2**	
3	**Called Session Selector**	**o**	**m**	**A.6.x/3**	
5	**User Information Field**	**m**	**m**	**A.6.x/4**	

[a] This entire column has the value of "i" if role is "responder"; otherwise the value is as marked.

[b] This entire column has the value of "i" if role is "initiator"; otherwise the value is as marked.

NOTE—

Annex D

(normative)

Ed Note: No updates beyond here %%

Requirements compliance statement proforma

D.1 Requirements questionaire

This annex may be used by a profile or the specification of a basic communications application[1] to claim that its upper layer requirements comply to this Profile. Such a claim indicates that upper layer requirements of the referencing specification are exactly identified by some or all of the features specified in this Profile. The requirements questionaire (table D.1) is the basis for the mOSI compliance statement. It is intended to be completed by the designers of the referencing specification.

1 For the purposes of this annex, the term "referencing specification" will refer to a "profile or the specification of a basic communication application."

Table D.1 – Requirements questionnaire

	Item	Compliant answer	Spec statement	Specification's comment
1	**Establishment role**	**Initiator; or Responder; or Both**		
2	**Normal data role**	**Requestor; or Acceptor; or Both; or Neither**		
3	**Release role**	**Requestor: or Acceptor: or Both; or Neither**		
4	**Authentication**	**Required[2] ; or Not required[3]**		
5	**AC negotiation**	**Required[4] ; or Not required[5]**		
6	**All "m" parms required (send and receive), and CULR-1 compliance?**	**Yes[1]**		
7	**All "o" parms required (send)?**	**Yes; No[2]**		

2 required = required for support

3 not required = left as an option for support

4 2, op cit.

5 3, op cit.

[1] If "no", the referencing specification may not claim that its required facilities are compliant to this Profile.

[2] If "no" the features not required for sending shall be identified in table D.2.

In table D.1, the answers (i.e., values) to the Items in column 1 are used in annexes A, B, and C. The values are used to determine the conditional expressions for tables in the annexes. For example, the item *Establishment role* is used in table A.1.1. In line 1 of table A.1.1, if the Item *Establishment role* has the value of "initiator" or "both", the result of c[1] is "m" – the Initiator role is mandatory. Otherwise, the Initiator role is "i" – the Initiator role is out of scope [of this Profile].

Table D.2 is used in conjunction with the compliance statement in D.2. It is used by a referencing specification to list the allowed features that it does not support for sending.

Table D.2 – Exceptions

	Referenced table (in annexes A, B and C)	Feature	Sending – not required (,)	Specification's comment
1	A/A.5.1	Calling AE titles[2]		
2		Called AE titles[2]		
3		Invocation ids		
4		User Information		
5	A/A.5.2	Responding AE title		
6		Invocation ids		
7		User Information		
8	A/A.5.3	User Information		
9	A/A.5.4	User Information		

10	A/A.5.5	User Information		
11	A/A.6.1	Form 1 (Directory name)		
12		Form 2 (Object id+integer)		
13	B/B.2.1.2	CPR		If Establishment-role is "responder" or "both"
14	B/B.3.1	Calling Presentation Selector		
15	B/B.3.2	Responding Presentation Selector		
16	C/C.4.1.3	Called Session Selector		
17		Extended User Data		
18	C/C.4.3.2	Reason Code		If Establishment-role is not "initiator"

19	C/C.4.4	User Data		If Release-role is not "responder"
20	C/C.4.5	User Data		If Release-role is not "initiator"
21	C/C.4.6	User Data		

D.2 Compliance statement

Based on tables D.1 and D.2, a referencing specification may make the following statement about its upper layer requirements being compliant to this Profile.

The requirements of _____ are mOSI compliant

[, for {association-establishment-initiation | association-establishment-response} only]

[{for {normal data sending only | normal data receiving only} | without normal data transfer}]

[, {for {release-requesting only | release-accepting-only} | without release}]

[, with authentication during connection-establishment]

[, with application-context negotiation]

[, with exceptions (see table D.2)].

Annex E

(normative)

Implementation conformance statement proforma

E.1 Implementation questionaire

This annex may be used by an implementation to claim that it supports some or all of the features specified in this Profile. The implementation may in fact support more of the upper layer facilities of this Profileæwithout violating any of the facilities of this Profile.

The implementation questionaire (table E.1) is the basis for the mOSI implementation conformance statement. It is intended to be completed by the designers of the referencing implementation.

Table E.1 – Implementation questionnaire

	Item	Conformant answer	Implementation	Implementation's comment
1	**Establishment role**	**Initiator; or Responder; or Both**		
2	**Normal data role**	**Requestor; or Acceptor; or Both; or Neither**		
3	**Release role**	**Requestor: or Acceptor: or Both; or Neither**		
4	**Authenticatio n**	**Supported; or Not supported**		
5	**AC negotiation**	**Supported; or Not supported**		
6	**All "m" parms sent and received,**	**Yes[1]**		

	and CULR-1 compliance?		
7	**All "o" parms sent?**	**Yes; No[2]**	

[1] If "no", the referencing implementation shall not claim that it is conformant to this Profile.

[2] If "no" the features not supported for sending shall be identified in table E.2.

In table E.1, the answers (i.e., values) to the Items in column 1 are used in annexes A, B, and C. The values are used to determine the conditional expressions for tables in the annexes. For example, *Establishment role* is used in table A.1.1. In line 1 of table A.1.1, if the Item *Establishment role* has the value of "initiator" or "both", the result of c[1] is "m" - the Initiator role is mandatory. Otherwise, the Initiator role is "i" - the Initiator role is out of scope [of this Profile].

Table E.2 is used in conjunction with the conformance statement in E.2. It is used by a referencing implementation to list the allowed features that it does not support for sending.

Table E.2 – Conformance exceptions

	Referenced table (in annexes A, B and C)	**Feature**	**Sending – not supported (,)**	**Implementation's comment**
1	**A/A.5.1**	**Calling AE titles**[1]		
2		**Called AE titles**[1]		
3		**Invocation ids**		
4		**User Information**		
5	**A/A.5.2**	**Responding AE title**		

1 implies all parts of AE title, i.e. AP title and AE qualifier

6		**Invocation ids**		
7		**User Information**		
8	**A/A.5.3**	**User Information**		
9	**A/A.5.4**	**User Information**		
10	**A/A.5.5**	**User Information**		
11	**A/A.6.1**	**Form 1 (Directory name)**		
12		**Form 2 (Object id+integer)**		
13	**B/B.2.1.2**	**CPR**		**If Establishment-role is "responder" or "both"**
14	**B/B.3.1**	**Calling Presentation Selector**		
1	**B/B.3.2**	**Responding**		

5		**Presentation Selector**		
16	**C/C.4.1.3**	**Called Session Selector**		
17		**Extended User Data**		
18	**C/C.4.3.2**	**Reason Code**		**If Establishment-role is not "initiator"**
19	**C/C.4.4**	**User Data**		**If Release-role is not "responder"**
20	**C/C.4.5**	**User Data**		**If Release-role is not "initiator"**
21	**C/C.4.6**	**User Data**		

E.2 Conformance statement

Based on tables E.1 and E.2, a referencing implementation may make the following statement about its conformance to this Profile.

This _____ is mOSI compliant

[, for {association-establishment-initiation | association-establishment-response} only]

[{for {normal data sending only | normal data receiving only} | without normal data transfer}]

[, {for {release-requesting only | release-accepting-only} | without release}]

[, with authentication during connection-establishment]

[, with application-context negotiation]

[, with conformance exceptions (see table E.2)].

Annex F

(Normative)

Minimal OSI Object Identifiers

The following are the object identifiers for the default abstract syntax, default transfer syntax and default application context for use with Minimal OSI. These object identifiers are registered with this Profile.

F.1 Default Abstract Syntax for Minimal OSI

This object identifier can be used as the abstract syntax name when the application protocol (above ACSE) can be treated as single presentation data values (pdv's). Each PDV is a sequence of consecutive octets without regard for semantic or other boundaries. The object identifier may also be used when, for pragmatic reasons, the actual abstract syntax of the application is not identified in Presentation Layer negotiation.

The OBJECT IDENTIFIER for the default abstract syntax is:
{iso(1) standard(0) culr(11188) mosi(3) default-abstract-syntax(1) version(1)}

NOTES

1. Applications specified using ASN.1 should not use the default abstract syntax.

2. As this OBJECT IDENTIFIER is used by all applications using the default abstract syntax for mOSI, it cannot be used to differentiate between applications. One of the ACSE parameters, e.g. AE-Title, may be used to differentiate between applications.

F.2 Default Transfer Syntax for Minimal OSI

A transfer syntax is the representation of the abstract syntax during data transfer. If an application doesn't make a distinction between the abstract and transfer syntax, the same object identifier should be used to denote both syntax's.

In the case where:

a) the abstract and transfer syntax are not the same; and
b) the default abstract syntax object identifier has been used (see F.1 above)

the following default transfer syntax object identifier may be used:
{iso(1) standard(0) culr(11188) mosi(3) default-transfer-syntax(2) version(1)}

F.3 Default Application Context for Minimal OSI

The default application context for mOSI is the application context used to denote the application's universe of discourse.

The OBJECT IDENTIFIER for the mOSI default application context is
{iso(1) standard(0) culr(11188) mosi(3) default-application-context(3)}

This application context supports the execution of any application using the default abstract syntax defined in F.1.

Annex G
(Informative)

Minimal OSI Concepts

This annex defines concepts used in the Minimal OSI upper layer facilities.

G.1 Definitions of Minimal OSI Upper Layer Facilities

The minimal OSI Profile (**mOSI**) specifies a minimal set of OSI upper layer facilities that support basic communications applications. A **basic communications application (BCA)** simply requires the ability to open and close communications with a peer and to send and receive messages with the peer. The OSI upper layer facilities are defined by the ACSE, presentation and session protocol specifications. When these facilities are specified as a set of interrelated standards for the purpose of providing a common service that functional specification is a **Stack specification**. An implementation of an identified stack specification is a **Stack** or a **stack implementation.** The specification that defines the minimal facilities of the Session Layer, Presentation Layer, and ACSE (CULR-3) is the **mOSI specification** or the **mOSI stack specification** – this Profile.

A functional specification of a formal programmatic interface and a set of supporting local services for an identified stack specification is a **Platform specification**. A **Platform** is an implementation of an identified platform specification. The functional specification of a formal programmatic interface and a set of supporting local services for the mOSI stack specification (CULR-3) is the **mOSI platform specification** and an implementation of the mOSI platform specification is a **mOSI platform**.

A functional specification of the formal programmatic interface to an identified stack specification is an **API specification.** An **API** is an implementation of an identified API specification. Likewise, a **mOSI API specification** is a functional specification of the formal programmatic interface to the mOSI stack specification (CULR-3).

G.2 Use of the mOSI stack specification

The mOSI stack specification is intended for connection-oriented applications that do not require all of the services of the upper layers, but only the basic communications services. Figure G.1 is a Venn Diagram which represents a classification of the universe of all possible connection-oriented applications. Each subset of the universe applicable to this discussion is supplied below.

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G.2.1 Connection-Oriented Applications

The set of connection-oriented applications consists of

a) applications needing only basic communications services. A basic communications application requires the ability to open and close communications and to send a receive messages.
b) applications needing more that basic communications services

G.2.2 Non-Basic Connection-Oriented Applications Needing More than Basic Services

The set of connection-oriented applications needing more than basic communications facilities, from an OSI perspective, includes those applications which use one or more of the following facilities: session major or minor synchronize; resynchronize; activity management. Some examples are

a) RTSE-based applications, e.g. MTA-MTA transfer of X.400
b) FTAM with optional recovery
c) TP with optional two-phase commitment (i.e. CCR)
d) some optional aspects of VTP

G.2.3 Connection-Oriented Applications Needing Only Basic Services

The set of connection-oriented applications needing only basic communications services include those applications which require the ability to open and close communications and to send and receive messages. Some examples are

a) Kernel applications, which are written specifically for OSI services.
b) Migrant applications, which are "non-OSI applications" such as those currently supported by TCP programmatic interfaces. The X Window system (X) and IPS applications are examples of potential migrant applications.

G.2.3.1 Kernel applications

The set of all possible Kernel applications include those which are written specifically for OSI services that only require basic communications services. Some examples are

a) ISO and ITU-T defined applications which do not use the RTSE, e.g. UA-MS transfer of X.400
b) FTAM implementations which do not user recovery
c) TP implementations which do not use two-phase commitment
d) VTP without destructive interrupt facility
e) all ROSE based applications

These applications may access the mOSI stack by using either an API or by mapping directly onto mOSI. Applications using an API are considered to be platform applications. Those applications mapping directly onto mOSI are considered to be **stand-alone applications**.

G.2.3.2 Migrant Applications

The set of all possible Migrant applications include those that are either to be migrated from TCP to OSI or they are applications that require the least common denominator communication facility – because they must operate over several "transport" mechanisms. Some examples are:

a) TCP/IP applications
b) Connection-Oriented "user written" applications
c) X-windows and IPS applications

These applications may access the mOSI stack by using either a migrant API or by mapping directly onto mOSI. A migrant API is considered to be a platform for accessing the mOSI stack. Therefore those applications which use a migrant API are considered to be platform applications. Those applications mapping directly onto mOSI are considered to be stand-alone applications.

G.3 Users of the mOSI Stack Specification

Out of the set of all connection-oriented applications, those applications using only basic communications services are possible users of the mOSI stack specification. This specification is intended to address implementors of migrant and kernel applications using either a platform or accessing the mOSI stack directly (stand-alone users). This specification is also intended to be referenced by ISP designers.

G.4 OSI misconceptions

Today's APIs do not efficiently support basic communications applications with a conformant seven-layer stack. However basic communications applications (both migrant and kernel) represent the overwhelming majority of potential OSI applications.

OSI is most often viewed as only being fat and slow. This is because OSI is perceived as the implementation of the full function upper layer stack with a corresponding complex, mostly unneeded, and difficult to use full API. The facilities required by migrant and kernel applications represent approximately 5% of the overall functionality provided by a full stack.

A full function stack and its API are intended for those applications needing more than the basic communications services, such as MTA to MTA transfer of X.400 and TP with CCR. The facilities of the full upper layers simplify the design of sophisticated distributed applications that require check pointing with recovery - applications such as RTSE and CCR.

For a basic communications mapping onto a full stack, the unused 95% of functionality intended for a fuller application, could potentially impact performance. Having an API which only provides mapping onto basic services would make OSI less intimidating.

Another misconception about OSI deals with the use of ASN.1 Some believe that the use of OSI predicates the use of ASN.1 for application semantics. This is not the case. ASN.1 abstract definitions and the use of ASN.1 Basic Encoding Rules is just one of the options available to an applications designer.

Annex H

(Informative)

Implementation considerations

This Internationally Standardized Profile is not an implementation specification. However, the size and efficiency of an implementation of OSI (any OSI implementation, not just of mOSI) is significantly affected by the implementation design. The OSI 7-layer model is a protocol specification model and in many cases may not be the best way to implement OSI.

This informative annex is concerned only with the implementation of the upper three layers of OSI In particular, this annex is concerned with an implementation of the mOSI specified subset of the OSI upper layers facilities. This annex makes several implementation suggestions. Experience has shown that these implementation approaches yield small and fast implementations—especially when compared to some of the well known OSI proof-of-concept implementations.

H.1 Layering for mOSI implementations

The services and protocols for the upper three layers of OSI are specified separately. However, considerable efficiency can be gained if all three protocol machines are combined as one module and not as three separate modules requiring the definition of formal interfaces between them. This is especially true if operating system context switches occur when transferring between different modules.

NOTE—Currently there are no formally defined interfaces for session and presentation.

Combining layer protocol machines applies not only to mOSI implementations, but also to all OSI upper layer implementations. However, combining layers precludes testing them individually. Individual layer testing is not recommended. The three upper layer protocols provide an integrated set of services;. these services are not useful individually.

H.2 PDU generation for mOSI implementations

mOSI supports uncomplicated application protocols, i.e., byte stream or simple record oriented data transfer (which probably constitutes 95 to 99% of user application protocols). Therefore, the encoding of embedded PDU headers (PCI) for all three protocols is uniform. Using predefined protocol headers allows significant gains in protocol machine efficiency. This is especially true for data PDUs— PDUs that generally constitute the majority of PDUs exchanged.

Internet RFC xxxxx (ThinOsi Upper Layer Cookbook) is an example of explicit predefined PDU encodings for mOSI implementations. The RFC contains a full description of this technique including BER encodings for PDUs.

H.3 Parsing incoming protocol for mOSI

An upper layer protocol machine that only supports the facilities defined in mOSI need only recognize a very limited subset of all potential OSI PDU sequences. In particular, they need not recognize any non-mOSI protocol sequences.

A direct consequence of implementing only the mOSI defined facilities is that non-mOSI sequences are treated as unrecognized PDUs. The receipt of an unrecognized PDU results in a protocol error and in the release of the association. This does not lessen the utility of the implementation but it does reduce

the amount of code needed for error handling.

NOTE—It is always legal for an OSI protocol machine to abort an association.

H.4 Interfaces for mOSI implementations

ISPs currently do not include APIs. However, portability for a mOSI implementation can be significantly enhanced through the use of two of X/Open's XTI interfaces. The XTI for mOSI interface, currently under development provides a common interface for networked applications. It simplifies migration of networked applications from one open networking environment to another.

The standard XTI can be used to provide transport services to a mOSI implementation thus making a mOSI implementation easily portable to any network transport supporting XTI, e.g., Internet, NetBIOS, and a number of proprietary networks. Thus, XTI can be used both to interface mOSI to a network transport service and to provide mOSI services to networked applications. The following diagram illustrates the use of the XTI interfaces for mOSI implemented as a single module.

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Annex I

(informative)

Informative Bibliography

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